CELLULAR AND BIOCHEMICAL ACUTE ALVEOLAR RESPONSE TO MINERAL DUSTS IN RODENTS

J. Bignon, S. Le Maho, Cl. Lambre, G. Dibella, and R. Masse

Laboratoire de Recherche sur les Affections
Respiratoires et l'Environment
INSERM U 139 et ERA CNRS N° 845
Centre Hospitalier Intercommunal
40, Ave de Verdun
94010 Creteil Cedex, France

Laboratoire de Toxicologie Experimentale
CEA, BP 561
92542 Montrouge Cedex, France

We studied the pulmonary response of rats to the intratracheal instillation of 0.5 mg of chrysotile, acid leached chrysotile, crocidolite and quartz; furthermore the effect of 5 mg of quartz was also studied. Dusts were suspended in 0.3 ml of saline, chrysotile was sonicated prior to the instillation, control rats were instillated with saline. Alveolar washing fluid and lungs were studied at 24 hours, 48 hours, 1, 2 and 4 weeks after instillation. Rats were anaesthetized by an intraperitoneal injection of Nembutal, then exsanguinated by sectionning the dorsal aorta. The lungs removed from the chest cavity were washed several times with a total of 50 ml of saline cell. Viability was immediately estimated by the Trypan blue dye exclusion test and cells were counted using a hemocytometer. Smears were stained with Wright Giemsa stain for differential numeration.

We noticed that about 10% of the total number of macrophages did not contain any particles. The total number of cells harvested from animals treated with 0.5 mg of dust increased by about 2 folds during the two days following the instillation, then came back to a value close to that obtained from control animals up to 4 weeks, except for animals instillated with quartz which exhibited a second increase at 4 weeks. The total number of cells from animals treated with 5 mg of quartz remained 3 folds higher than that from control animals during all the experiment.

The increased number of alveolar cells was due on the one hand partly to a moderate increase of the number of macrophages, on the other hand mostly to a recruitment of neutrophils in airways. This recuritment was associated with an increased protein content of the lavage fluid: during the first two days was noticed an important exsudation of serum proteins, as indicated by the albumin content of the lavage fluid, while a local synthesis was probably responsible for the "proteinosis" observed in the animals inoculated with 5 mg of quartz. The role played by the complement system in the chemotaxis of leukocytes and the release of elastase within the alveolar spaces are under investigation.

100264892

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0000